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IS 6788 (1973): Chromite sand for use in foundries [MTD 14: Foundry]

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Indian Standard
SPECIFICATION FOR
CHROMITE SAND FOR USE IN FOUNDRIES

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INDIAN STANDARDS INSTITUTION
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NEW DELHI 110002

Indian Standard

SPECIFICATION FOR

CHROMITE SAND FOR USE IN FOUNDRIES

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(Continued on page 2)

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(Continued from page 1)

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Indian Standard

SPECIFICATION FOR CHROMITE SAND FOR USE IN FOUNDRIES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 25 January 1973, after the draft finalized by the Foundry Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 Chromite sand is used either as a moulding sand or as a core sand in the production of castings.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirements of chromite sand for use in foundries.

2. SUPPLY OF MATERIAL

2.1 General requirements relating to the supply of chromite sand for use in foundries shall be as laid down in IS : 1387-1967†.

2.2 The material shall have shining black appearance and shall be free from foreign materials.

3. GRADES

3.1 The material shall be of two grades, namely, (a) Fine, and (b) Coarse.

*Rules for rounding off numerical values (*revised*).

†General requirements for the supply of metallurgical materials (*first revision*).

4. CHEMICAL COMPOSITION

4.1 Chromite sand shall have the following chemical composition on dry mass basis. The loss on ignition shall be 1 percent, *Max*:

<i>Constituent</i>	<i>Requirement</i>
	percent
Cr_2O_3	44 <i>Min</i>
Fe_2O_3	26 <i>Max</i>
SiO_2	4 <i>Max</i>
CaO	0.5 <i>Max</i>

NOTE—‘Indian Standard Methods of chemical analysis of chromite sand’ is under preparation. Till it is published, the methods of chemical analysis shall be as agreed to between the purchaser and the supplier.

4.1.1 If required, maximum limit for magnesium oxide (MgO) content may also be specified as agreed to between the purchaser and the supplier.

5. pH VALUE

5.1 The pH value of the sand, when determined in accordance with the method specified in Appendix A, shall be between 7.00 and 9.0.

6. ACID DEMAND VALUE

6.1 The acid demand value, when determined in accordance with the method given in Appendix A, shall conform to the following requirements:

pH	3	4	5
Acid	10 ml	8 ml	6 ml
Demand value, <i>Max</i>			

7. FUSION POINT

7.1 When tested in accordance with IS:1918-1966*, the fusion temperature of chromite sand shall be not below 1800°C .

8. GRAIN SHAPE

8.1 When tested in accordance with IS:1918-1966*, the washed sand grain shall be mostly sub-angular in shape.

*Methods of physical tests for foundry sands.

9. GRAIN FINENESS

9.1 The fineness of the two grades of chromite sand shall conform to the following requirements:

*IS Sieve Designation	Fraction Retained on	
	Fine Grade (F) percent	Coarse Grade (C) percent
710 micron	—	5 Max
500 "	—	10 Max
355 "	—	10-25
250 "	3 Max	10-25
212 "	18 Max	10-20
150 "	70 Min	10-20
106 "		7-20
75 "	12 Max	12 Max
Pan		6 Max

NOTE—When IS Sieves are not available, equivalent BS or ASTM Test Sieves specified in Appendix B may be used. The BS and ASTM Sieves listed in Appendix B have the apertures within the limits specified for the corresponding IS Sieves.

10. CLAY CONTENT

10.1 The clay content when determined in accordance with IS:1918-1966† shall not exceed 0.75 percent.

11. SAMPLING

11.1 Representative samples shall be drawn according to the scheme of sampling given in IS:1811-1961‡.

11.2 Moisture Content—When tested in accordance with the method given in IS:1918-1966† shall not be more than 0.5 percent.

12. PACKING

12.1 Unless otherwise specified, chromite sand shall be supplied in polythene moisture-free bags each containing 50 kg.

13. MARKING

13.1 The bags containing chromite sand shall be clearly marked with the following:

- Grade of the material,
- Manufacturer's name, and
- Trade-mark.

*See IS:460-1962 Specification for test sieves (revised).

†Methods of physical tests for foundry sands.

‡Methods of sampling foundry sands.

13.1.1 The material may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

APPENDIX A
(*Clauses 5.1 and 6.1*)

TEST METHODS

A-1. QUALITY OF REAGENTS

A-1.1 Unless otherwise specified, pure chemicals and distilled water (*see IS : 1070-1960**) shall be used in the tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

A-1.2 Reagents

A-1.2.1 *Hydrochloric Acid* — 0.1 N.

A-1.2.2 *Sodium Hydroxide Solution* — 0.1 N.

A-2. DETERMINATION OF pH VALUE

A-2.1 Preparation of the Sample — Take about 50 g of chromite sand in 100 ml of distilled water and stir together for at least 5 minutes.

A-2.2 Test Temperature — The test shall be carried out at $27 \pm 2^{\circ}\text{C}$.

A-2.3 Procedure — Measure the *pH* of the supernatant liquid at short intervals, with repeated stirring by any standard *pH* meter using glass electrodes, until constant.

NOTE — The *pH* is determined at room temperature preferably by electrometric methods.

A-3. DETERMINATION OF ACID DEMAND VALUE

A-3.1 Test Temperature — The test shall be carried out at $27 \pm 2^{\circ}\text{C}$.

*Specification for water, distilled quality (*revised*).

A-3.2 Procedure — Stir together for at least 5 minutes, 50 g of chromite sand, 50 ml of distilled water and 50 ml of 0.1 N hydrochloric acid. Allow to stand for a minimum period of 1 hour and back-titrate the resulting solution with 0.1 N sodium hydroxide solution to *pH* 3, 4 and 5. The amount of acid consumed at each *pH* level gives the acid demand value of the sand.

APPENDIX B

[Clause 9.1 (Note)]

COMPARATIVE SIEVE DESIGNATIONS OF IS, BS AND ASTM TEST SIEVES

<i>IS Sieve</i>	<i>BS Sieve</i>	<i>ASTM Sieve</i>
710 micron	22	707
500 „	30	500
355 „	44	354
250 „	60	250
212 „	72	210
150 „	100	149
106 „	150	105
75 „	200	74

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s ²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²

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